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10/689,275	10/20/2003	Ian Robinson	NG(ST)-6583	2918

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EXAMINER	
VLAHOS, SOPHIA	

ART UNIT	PAPER NUMBER
2611	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/689,275	ROBINSON ET AL.	
	Examiner	Art Unit	
	SOPHIA VLAHOS	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 February 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,5,6,8-10,12-19,25 and 26* is/are pending in the application.

4a) Of the above claim(s) *2-4,7,11,20-24 and 27* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1, 5-6, 8-10, 13-19, 25-26* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *28 February 2008* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to the rejection of independent claims 1 and 19 have been considered but are moot in view of the new ground(s) of rejection.

Applicant's arguments filed 2/28/08 addressing the rejection of independent claims 19 and 26 have been fully considered but they are not persuasive.

Page 11 of "Remarks" section, Applicant argues: “It is respectfully submitted, however, that one skilled in the art would not seek to utilize a sigma-delta ADC with a spectrum spreading arrangement as proposed in the Office Action. For example, the spread approach applied in Swanke varies the frequency in which the spreading injection is varied at a rate faster than the bandwidth of the desired signal, requiring oversampling of the signal. This effectively spreads the interference throughout the expanded bandwidth of the signal, such that it will not corrupt more than one spreading state of the signal. See Swanke, Col. 3, lines 24-45. ”… “.Sigma-delta ADCs redistribute signal error across an expanded bandwidth in a similar manner, and it is respectfully submitted that the application of the sigma-delta modulation in addition to the spread signal would provide minimal gains. It is thus respectfully submitted that one skilled in the art would not seek to spread a signal, convert the signal at a sigma-delta ADC, and despread the signal as proposed in the Office Action. Since there is no reason for one of skill in the art to incorporate the sigma-delta ADC into the proposed combinations of Swanke in view of Tulino and Tulino in view of Park and Maruyama, one skilled in the art would not be lead to incorporate the clipping component to avoid overshoot and

settling in the sigma-delta ADC as suggested in the Office Action. It is thus respectfully submitted that claims 13 and 26 define patentable invention over the cited art. "

Examiner disagrees "that one skilled in the art would not seek to spread a signal, convert the signal at a sigma-delta ADC, and despread the signal as proposed in the Office Action. Since there is no reason for one of skill in the art to incorporate the sigma-delta ADC into the proposed combinations of Swanke in view of Tulino" for the following reasons. The prior art Swanke teaches that the spreading and dispreading reduces spurious emissions (column 3, lines 40-45). The prior art (Panasik et. al., also teaches an ADC circuit having a clipping component (that maintains the input signal between a predefined range, i.e. within the dynamic range of the ADC).

According to the MPEP 2146 [R-6] "The key to supporting any rejection under 35 U.S.C. 103 is the clear articulation of the reason(s) why the claimed invention would have been obvious. The Supreme Court in KSR noted that the analysis supporting a rejection under 35 U.S.C. 103 should be made explicit. The Court quoting In re Kahn, 441 F.3d 977, 988, 78 USPQ2d 1329, 1336 (Fed. Cir. 2006), stated that "[R]ejections on obviousness cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.'" KSR, 550 U.S. at ___, 82 USPQ2d at 1396."

Therefore based on the prior art of the record, it would have been obvious to a person of ordinary skill in the art to include the clipping component of Panasik in the system of Swanke, to ensure that the signal input to the A/D block 214, is between a

predefined amplitude range (dynamic range) of the ADC. Therefore claims 13, 26 are still rejected under 35 U.S.C. 103(a) as being unpatentable over Swanke (U.S. 5,564,097) in view of Tulino (U.S. 2007/0041310) and Panasik et. al., (U.S. 2002/0160732).

Drawings

2. The drawing (sheet 4/10 with amended Fig. 11) was received on 2/28/08 . This drawing is acceptable.

Specification

3. The amendment to the specification (paragraph [0050]) was received on 2/28/08 and is acceptable.

Claim Objections

4. Claims 5-6, 8-10 are objected to because of the following informalities: Claims 5-6, 8-10 all depend on claim 1, therefore their preambles (currently "The system of Claim 1,") should match the preamble of claim 1, that reads "A transmitter system,".

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1, the limitation “a mixer for frequency converting the spread input signal to provide an unconverted spread input signal;” is misplaced and should be moved after the limitation “spreader….to provide a spread input signal”. The limitation “a signal converter that converts **the frequency converted** spread input signal...." (emphasis added) is unclear to which frequency converted signal refers to, since there is no previously mentioned “frequency converted spread input signal”, only an “upconverted spread input signal”. Furthermore it is unclear whether the “signal converter” is a different component than the “despreader”, since both the “signal converter” and “despreader” convert a signal to a second domain. Last limitation of claim 1, recites: "...an antenna that transmits the despread input signal..." however there is not previous reference to a “despread input signal”.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 1, 5-6, 10, 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kenington (U.S. 6,549,067) in view of Swanke (U.S. 5,564,097).

With respect to claims 1, 6, 10, 12 as best understood, Kenington discloses: a signal converter that converts the frequency converted input signal from a first domain

to a second domain to provide a converted input signal (Fig. 1, combination of block 130, "DAC", conversion from digital (first domain) to analog (second) domain); a mixer for frequency converting the input signal to provide an unconverted input signal (Fig. 1, mixer 134, see up-conversion to RF domain, see column 3, lines 12*-14); an antenna that transmits the input signal (see column 3, lines 15-19, antenna used for transmission, system output).

Kenington does not expressly teach: a spreading code generator that produces a spreading code; a spreader that combines the spreading code with an input signal to provide a spread input signal; a despreader that despreads the unconverted spread input signal to provide the input signal in the second domain. Furthermore the signal converter, mixer and antenna do not function on spread signals.

In the field of spurious signal reduction, Swanke discloses: a spreading code generator that produces a spreading code (Fig. 2, blocks 208, 216, see column 3, lines 3-5 and column 3 lines 67 through column 4, lines 1-2 where the frequency-hopped spread injection signal corresponds to the spreading code); a spreader that combines the spreading code with an input signal to provide a spread input signal (Fig. 2, mixer 206); a despreader that despreads the spread input signal to provide the input signal in a second domain (Fig. 2, mixers 222,222', dispreading in a different domain (digital domain) than spreader 206).

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify the system of Kenington based on the teachings of Swanke (the use of spread/despread injections signals) to perform spurious suppression (obtained

by the virtue spreading and dispreading) see Swanke column 3, lines 37-49, column 4, lines 25-28, see also transmitter implementing the spreading/dispreading approach).

With respect to claim 5, Kenington does not teach: a feedback loop coupling the despreader to the spreader for time aligning the dispreading with the spreading. However, Swanke discloses the above limitation (Fig. 2, block 216 "synchronization circuitry" column 3, lines 8-14). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify the system of Kenington based on the teachings of Swanke so that spreading/despreading of Swanke are synchronized (Swanke column 3, lines 11-14).

9. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kenington (U.S. 6,549,067) in view of Swanke (U.S. 5,564,097) as applied to claim 1, and further in view of Mollenkopf (U.S. 7,099,402)

With respect to claim 8, neither Kenington discloses: wherein the signal converter is a digital-to-analog converter (DAC) (block 130 Fig. 1). However, Kenington does not specify the DAC is a delta-sigma DAC.

In the same field of endeavor (signal transmission), Mollenkopf discloses: a delta-sigma DAC (see column 5, lines 65-67 through column 6, lines 1- 20, sigma-delta type DAC).

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify the system of Kenington and Swanke based on the teachings of Mollenkopf to shape noise away from the signal of interest (noise - shaping property of

sigma delta modulation based DAC)(see Mollenkhopf, column 5, lines 65-67, through column 6, lines 1-20).

Method claim 19, is rejected based on a rationale similar to the one used to reject apparatus claim 1 above.

10. Claims 9, 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kenington (U.S. 6,549,067) in view of Swanke (U.S. 5,564,097) as applied to claims 1, and 19 respectively, and further in view of Sato (U.S. 5,751,705).

With respect to claim 9, the system obtained by the combination of Kenington and Swanke further includes the despreader mitigates degradation and out-of-band (OOB) emissions associated with the spread signal (see column 3, lines 38-46, where the spreading/despreading suppresses signal spurious levels (i.e. degradation and OOB emissions)).

Neither Kenington nor Swanke teach: a clipping component that reduces peaks associated with the spread input signal.

In the same field of endeavor (radio frequency transmitters) Sato discloses: clipping component that reduces peaks associated with the spread input signal (see Fig. 2, block 107 “LIMIT” clipping component reducing peaks associated with spread input signals out of SS blocks, see column 6, lines 15-22, see amplitude limitation (peak reduction)).

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify the system of Kenington and Swanke based on the teachings of Sato, to achieve peak power suppression without undesirable spectral distortions (see Sato column 3, lines 47-54).

With respect to claim 25, method claim 25 is rejected based on a rationale similar to the one used to reject claim 9 above.

11. Claims 13-16, 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Swanke (U.S. 5,564,097) in view of Tulino (U.S. 2007/0041310) and Panasik et. al., (U.S. 2002/0160732).

With respect to claim 13, Swanke dislcoses: a spreading code generator that generates a spread spectrum signal (Fig. 2, block 208, column 3, lines 3-6, the pseudo-random (spread injection) signal); a spreading circuit that receives an input signal and combines the input signal with the spread spectrum signal to provide a spread input signal (Fig. 2, mixer 206, column 3, lines 5-6); and a despreading circuit that despreads the spread input signal (Fig. 2, mixers 222 and 222' and block 218 column 3, lines 15-21).

Swanke does not expressly teach: a spreading code generator that produces a direct sequence spread spectrum (DS-SS) spreading code; the spreading circuit receives the input signal and combines the input signal with the DS-SS spreading code

to provide a spread input signal; a clipping component that reduces peaks associated with the spread input signal.

In the same field of endeavor (combination of DS-SS and FH-SS), Tulino discloses: a spreading code generator (Fig. 3, block 308, PN-GEN) that produces a direct sequence spread spectrum (DS-SS) (output of block 304, PN-code is interpreted to correspond to the claimed DS-SS signal) signal, and combines the input signal with the DS-SS signal to provide a spread input signal (Fig. 3, block 304, see paragraph [0032])

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify the system of Swanke based on the teachings of Tulino so that the spreading code generator that produces a direct sequence spread spectrum (DS-SS) spreading code, and combines the input signal with the DS-SS spreading code to provide a spread input signal , the rationale behind such a modification is to generate a spread input signal (spread injection signal of Swanke) using a DS-SS signal (PN spreading signal) of Tulino, because using PN codes to spread signals minimizes fading and interference.

In the same field of endeavor (wireless communications) Panasik et. al., disclose: a clipping component that reduces peaks associated with an input signal (Fig. 2, clipping circuit 20, see abstract and paragraph [0009]).

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify the system of Swanke and Tulino based on the teachings of Panasik et. al., so that a clipping component (that is used with the sigma-delta ADC)

reduces peaks associated with the spread input signal, so that the spread input signal is maintained within a predefined threshold range when supplied to the ADC, so that overshoot and settling issues (caused by peaks in the input signal that exceed the dynamic range of the ADC) are avoided (Panasik et. al., paragraphs [0006]-[0008])

With respect to claim 14, Swanke discloses: wherein at least one of the spreading circuit and despreading circuit comprises a mixer (see Fig. 2, mixer206 and/or 222 and 222').

With respect to claim 15, Swanke discloses: further comprising a signal converter that converts the spread input signal from a first domain to second domain, the signal converter being one of a digital-to-analog converter (DAC) and an analog-to-digital converter (ADC) (Fig. 2, the ADC block 214).

With respect to claim 16, claim 16 is rejected based on a rationale similar to the one used to reject claim 8 above.

With respect to claim 26, claim 26 is rejected based on a rationale similar to the one used to reject claim 13 above.

12. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Swanke (U.S. 5,564,097) in view of Tulino (U.S. 2007/0041310), Panasik et. al., (U.S. 2002/0160732) and Esterberg et. al., (U.S. 6,873,281)

With respect to claim 17, neither Swanke nor Tulino or Panasik et. al., expressly teach: further comprising a second signal converter for converting the spread input signal from the second domain to the first domain,

In the same field of endeavor (sigma-delta modulators) Esterberg discloses: a signal converter for converting a signal from a second domain to a first domain (see Fig. 1, DAC 18 part of a sigma-delta ADC, column 1, lines 16-30). Therefore at the time of the invention, it would have been obvious to a person of ordinary skill in the art that the sigma-delta based ADC of Panasik et. al., used in the system of Swanke et. al., comprises a second signal converter (see DAC inside of the sigma-delta modulator that receives the spread IF signal) for converting the spread signal from the second domain to the first domain (see DAC converter 18 of Fig. 1 of Esterberg as part of the sigma-delta modulator feedback operation).

13. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Swanke (U.S. 5,564,097) in view of Tulino (U.S. 2007/0041310), Panasik et. al., (U.S. 2002/0160732) and Lampe et. al., (U.S. 5,966,646).

With respect to claim 18, neither Swanke nor Tulino, Panasik et. al., disclose: a mixer for frequency converting the spread input signal one of before signal conversion and after signal conversion.

In the same field of endeavor (super heterodyne receivers), Lampe et. al., disclose: a mixer for frequency converting an input signal (Fig. 1, mixer 26 (or 36) and IF1 signal out of LO 98, see column 1, lines 50-65, and column 3, lines 19-35).

At the time of the invention, it would have been obvious to a person of ordinary skill in the art, to modify the system of Swanke et. al., based on the teachings of Lampe et. al., to convert the signal to an intermediate frequency (to a first IF as taught by Lampe et. al.,) prior to spreading, so that the system of Swanke is implemented as a double-conversion super heterodyne receiver, to provide improved RF image rejection (Lampe et. al., column 1,lines 50-54).

Conclusion

14. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SOPHIA VLAHOS whose telephone number is (571)272-5507. The examiner can normally be reached on MTWRF 8:30-17:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammed Ghayour can be reached on 571 272 3021. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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Examiner, Art Unit 2611
3/20/2008

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